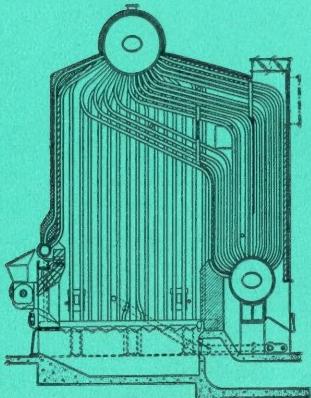


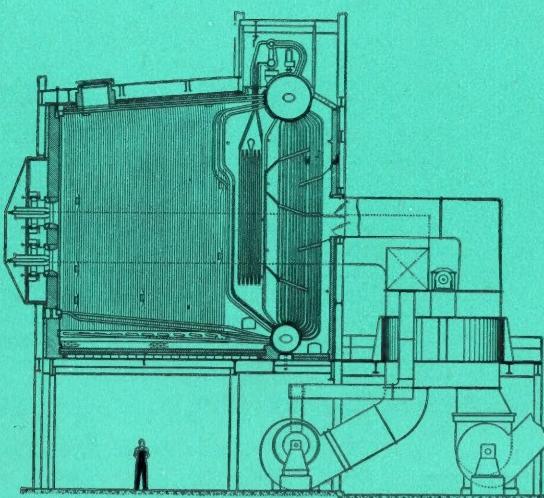
C-E FIRE TUBE BOILER (PREMIER TYPE)

Other types available. Capacities as low as 3,000 lb steam per hr.



C-E VERTICAL-UNIT BOILER, Type VU-10

Available with stoker, oil or gas firing.
Capacities—10,000 to 60,000 lb steam per hr.

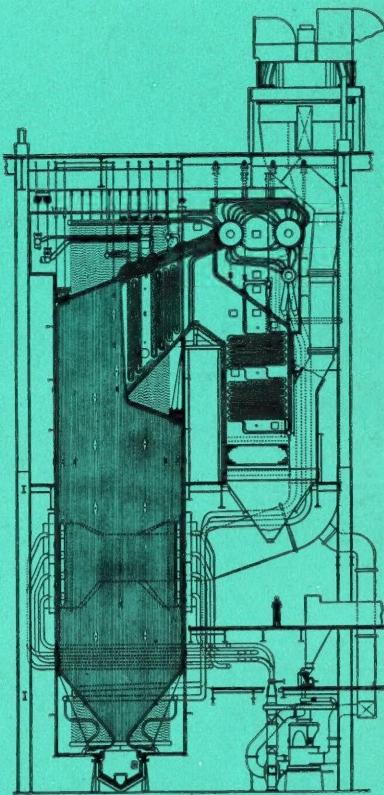


C-E VERTICAL-UNIT BOILER, Type VU-50

For pulverized coal, oil, gas or stoker firing. Capacities—50,000 to 350,000 lb steam per hr.

**UNITS
FROM
3,000
TO
1,500,000 LB
OF STEAM
PER HOUR**

BOILERS, FUEL-BURNING and RELATED EQUIPMENT



C-E STEAM GENERATING UNIT

For the larger utility and industrial applications. Usually pulverized coal, oil or gas fired. Capacities up to 1,500,000 (or more) lb steam per hr.

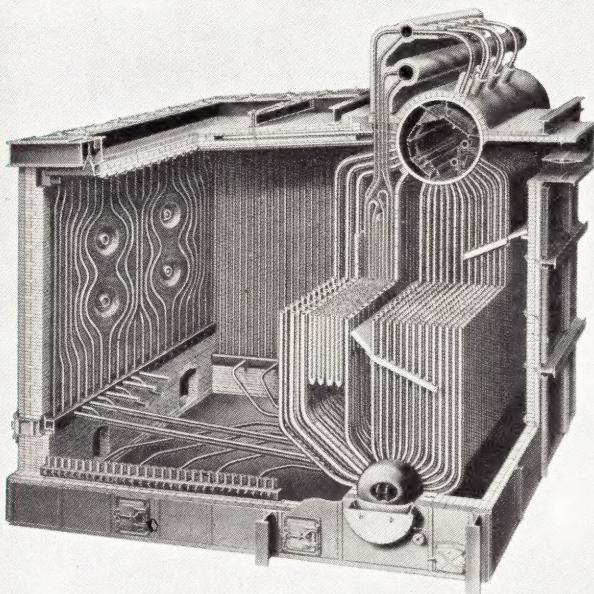
COMBUSTION ENGINEERING-SUPERHEATER, INC.

200 MADISON AVENUE

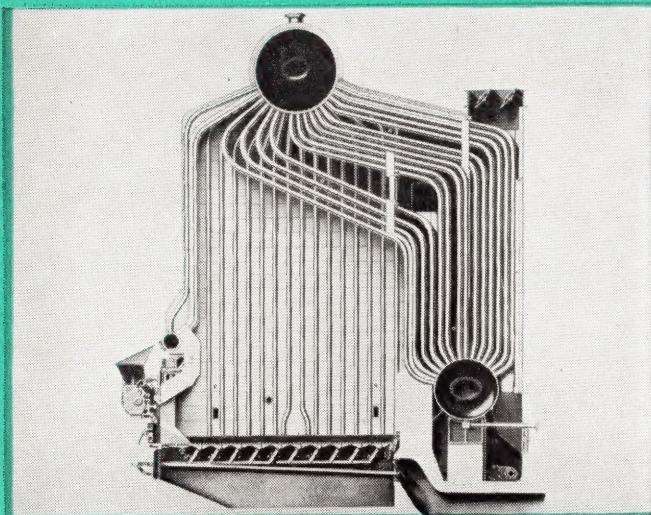
NEW YORK 16, N. Y.



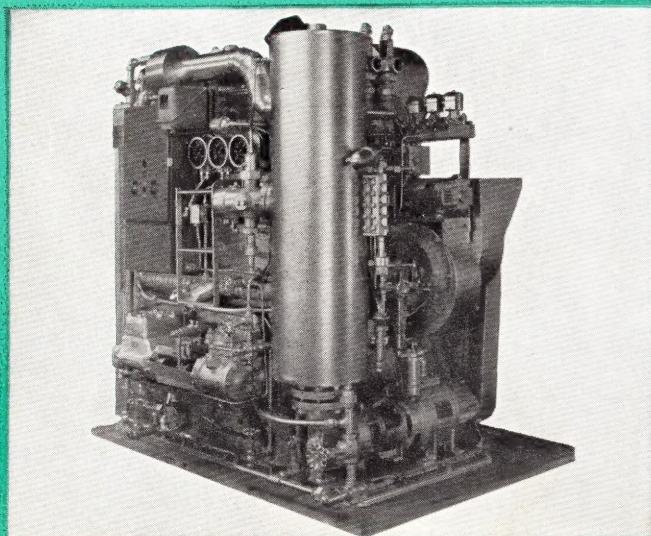
STEAM GENERATORS



Type VU-50 Boiler



Type VU-10 Boiler fired by C-E Spreader Stoker



C-E Re-circulation Steam Generator

C-E VERTICAL-UNIT BOILER, Type VU-50

For larger plants . . . pressure to 1000 psi . . . temperature to 900° F . . . capacity to 350,000 lb per hr. . . . any fuel or type of firing . . . indoor or outdoor type of construction.

The VU-50 Boiler enables the average plant to achieve a standard of economic performance closely approaching that obtained in large central power stations. Symmetrically designed, each transverse section of the boiler is identical with every other section. Thus the gas temperature entering the boiler bank is constant across the full width of the unit. Each section absorbs the same amount of heat, and produces the same amount of steam. The view at left shows a typical oil fired unit. This arrangement can be modified to permit the use of any fuel commercially available and is easily adaptable to the addition of heat recovery equipment.

C-E VERTICAL-UNIT BOILER- Type VU-10

For medium and smaller plants . . . pressure to 475 psi . . . capacity to 60,000 lb per hour . . . suitable for any type of fuel.

A standard unit, the VU-10 is designed for industrial load conditions and particularly for plants having a limited number of operating and maintenance personnel. Like the VU-50, it is of symmetrical design, and steam is released evenly across the full width of the unit. Gas flow is uniform, heat absorption is efficient and draft loss is low. Since the boiler is bottom supported, there is no outside supporting steel, and therefore, no seals or slip joints at the grate line to cause air leaks into the furnace. Type VU-10 boilers are adaptable to stoker firing or may be fired with oil or gas.

OTHER VERTICAL-UNIT BOILERS

Between the size limits of the VU-50 and the VU-10 are available several other similar standardized units, each designed to meet certain operating requirements. Collectively, the capacity of Vertical-Unit Boilers of all types now in service or on order aggregates more than 135,000,000 lb of steam per hr. The extent of this world-wide acceptance and the fact that hundreds of VU units have been service-proved over a period of many years gives the prospective purchaser assurance that the performance he expects will be fully realized.

C-E RE-CIRCULATION STEAM GENERATOR

A complete Steam Plant . . . absolutely reliable, fully automatic pushbutton control . . . compact to meet limited space conditions (floor space 5 ft. x 7 ft.—height 8 ft.) . . . quick steaming, from a cold start to full pressure and capacity in a matter of minutes . . . sizes up to 6,000 lb of steam per hr. and operating pressure up to 300 psi . . . available for either gas or oil firing.

Utilizing the principle of controlled recirculation, the flow of water through the unit is at least ten times the amount being evaporated, thereby assuring wetted surfaces at all points where the gases are in contact with the tubes. Because of this positive and adequate circulation, tubing diameter can be decreased, and the ratio of water velocity to tube diameter provides a high degree of turbulence, which results in a high heat transfer rate and extremely rapid steaming.

OTHER TYPES

In addition to the three units here illustrated, the Combustion line includes numerous other boiler designs of both fire tube and water tube types. Among the latter are the Sectional Header Boiler (straight tube type) and various bent tube designs such as the Type VM (a 3-drum, low-head design); the Type VA (a 4-drum design); Controlled Circulation Boilers and a variety of Waste Heat Boilers (both fire tube and water tube types). For the larger utility and industrial plants Combustion designs and builds steam generating units for any pressure, temperature or capacity required by modern practice.

STOKERS

SKELLY STOKER

Approximate Application Range—20 to 200 boiler hp.

A compact, self-contained underfeed stoker available in designs for burning either anthracite or bituminous coal. An alternate arrangement of fixed and moving grate bars assures lateral distribution of fuel and maintains a clean porous fire. Cantilever dump grates of non-cavalcanching type simplify ash removal. An integral forced-draft fan, with inlet control damper, permits positive regulation of air-coal ratio. Sixteen rates of coal feed through variable-speed transmission. Automatic control is standard equipment. Timken bearing equipped. Alemite lubrication throughout.

TYPE E STOKER

Approximate Application Range—150 to 600 boiler hp.

A single-retort, underfeed stoker—one of the best known and most widely used stokers in the world—several thousand in service in the U. S. A. This stoker is designed to burn a wide variety of bituminous coals, particularly those having caking and coking characteristics. The Type E has ram type feed supplemented by a reciprocating sliding bottom. Its grate surface consists of hollow, air-cooled grate bars arranged in an alternately fixed and moving relationship to condition the fuel bed and assure its steady movement toward the side dump trays which are of the cantilever type. Air supply is under zoned control with provision for introduction of air over the fire. Type E Stokers are available with steam, electric or hydraulic drive.

SPREADER STOKERS

Approximate Application Range—150 boiler hp. up to units producing 200,000 lb of steam per hr, or more.

The C-E Spreader Stoker is available in both dumping grate and continuous discharge types. This simple, rugged stoker is designed to burn a wide variety of coals and cellulose fuels. Hopper, feeding and distributing mechanism, variable-speed drive and motor are combined in a compact unit. Revolving spreader blades feed fuel into the furnace in criss-crossing streams which assure uniform distribution. Fines are burned in suspension and the rest of the fuel is burned on the grate. Grate surface is zoned for regulating air admission and to facilitate cleaning. All parts subject to wear are readily accessible for inspection, adjustment or replacement, when necessary. Rate of fuel feed and air supply may be regulated over a wide range and is readily adaptable to automatic control.

The continuous discharge spreader permits the burning of more fuel per foot of furnace width and thus extends the advantages of spreader firing to larger boilers than could be served by dumping-type spreaders. Since all areas of the traveling grate pass progressively through all phases of fuel distribution, the fuel-bed is remarkably uniform. The uniformity of fuel-bed and furnace conditions and the continuous and automatic scavenging of ash from the fuel-bed simplify stoker operation and reduce the amount of attendant labor to a minimum.

Continuous ash removal eliminates the periodic cleaning of the fire necessary with the dumping-type of grate, thus maintaining more uniform fuel-bed and furnace conditions, and permits all of the active grate area to function effectively 100 percent of the time.

TRAVELING GRATE STOKERS

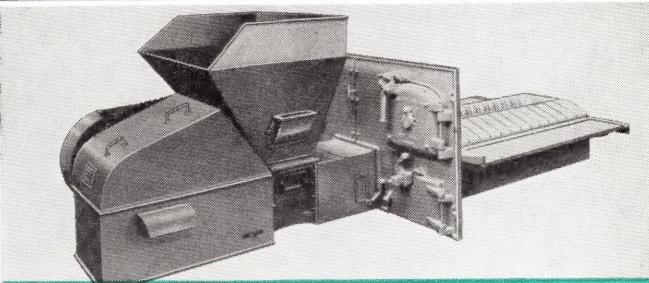
Approximate Application Range—150 rated boiler hp. up to units producing 275,000 lb of steam per hr, or more.

The C-E line of traveling grate stokers is complete, comprising both bar type and chain grate designs. The choice between these two types of grate surface depends chiefly on the characteristics of the fuel to be burned. The Coxe (bar type) stoker is employed mainly for anthracite and coke breeze while the Green (chain grate) is especially well suited to free-burning bituminous coals. Both types are available in forced-draft designs with air-admitting surfaces under zoned control. Chain grates are also built in natural-draft designs. C-E Traveling Grates—about 7300 have been installed—have a long and distinguished service record.

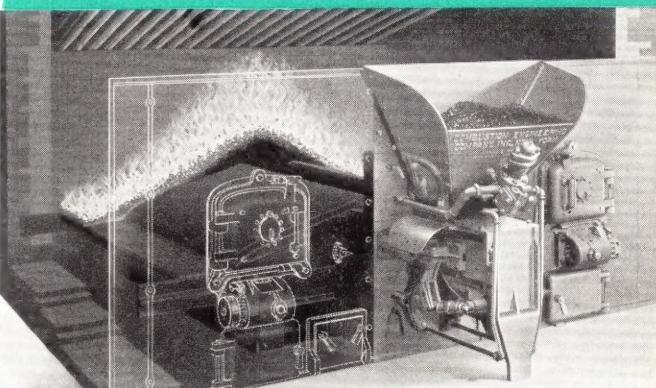
MULTIPLE-RETORT STOKER

Approximate Application Range—500 boiler hp up to units producing 200,000 lb of steam per hr, or more.

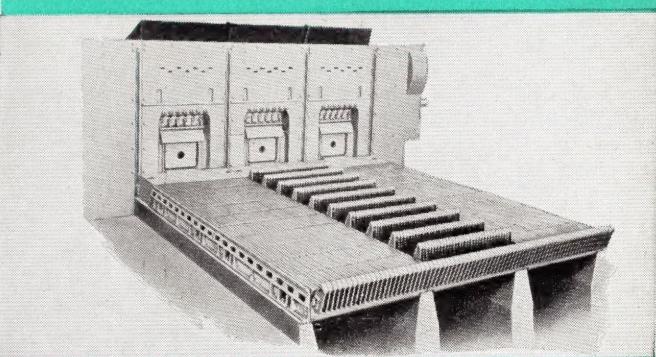
The C-E Multiple Retort Stoker, not illustrated, rounds out the most complete stoker line on the market. This stoker is designed to burn either coking or non-coking bituminous coal.



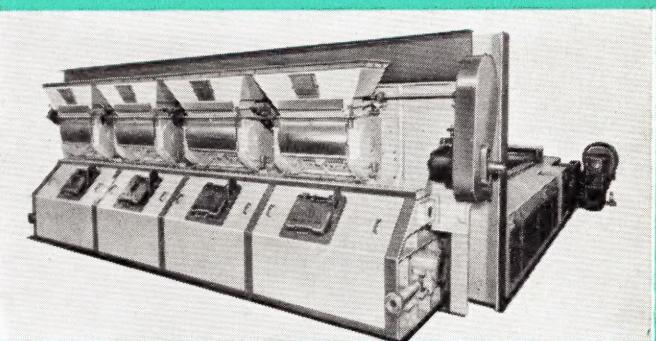
C-E Skelly Stoker



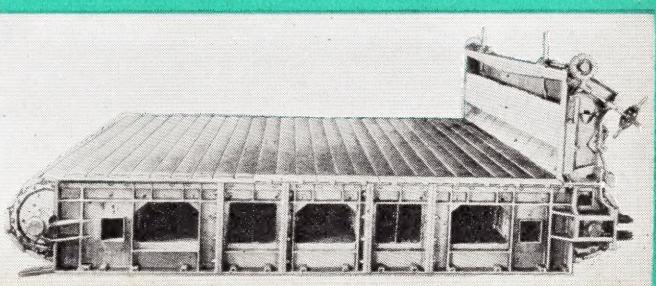
C-E Type E Stoker



C-E Spreader Stoker (Dumping Type)

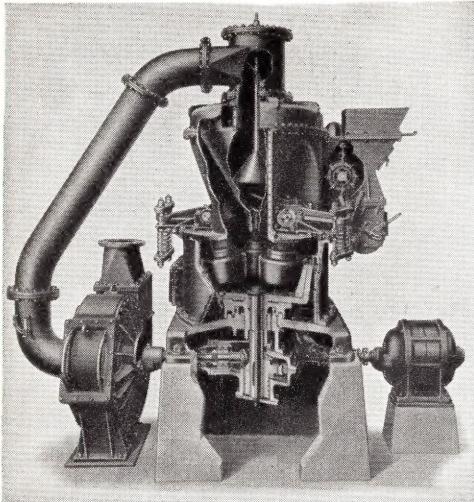


C-E Continuous Discharge Spreader Stoker



C-E Traveling Grate Stoker

PULVERIZED FUEL EQUIPMENT

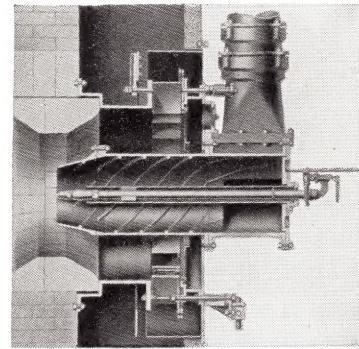


C-E Raymond Bowl Mill

Combustion Engineering was chiefly responsible for the commercial development of pulverized coal firing and has applied it more extensively than any other manufacturer. The principal components of C-E Pulverized Fuel Systems are the C-E Raymond Bowl Mill and C-E Burners of the horizontal, tangential and vertical types.

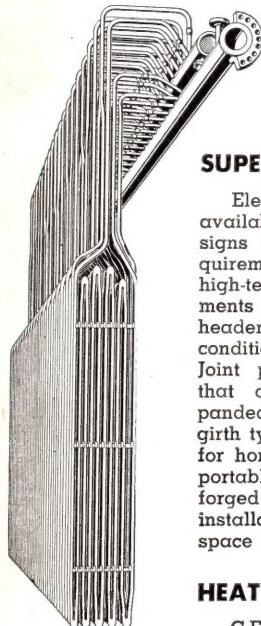
The Bowl Mill is widely regarded by operating engineers as the finest pulverizer on the market. A rotating bowl and two or more rollers comprise its grinding surfaces, which have no metal-to-metal contact. This design minimizes wear and noise. The Bowl Mill has a wide capacity range with virtually constant fineness.

C-E Burners are available for any fuel and operating conditions and for vertical, horizontal and tangential firing. Horizontal burners have a broad application while tangential burners (corner firing) are usually applied to large units. Both types are adaptable to the use of oil or gas as alternate or combination fuels.



C-E Horizontal Burner

SUPERHEATERS



SUPERHEATERS

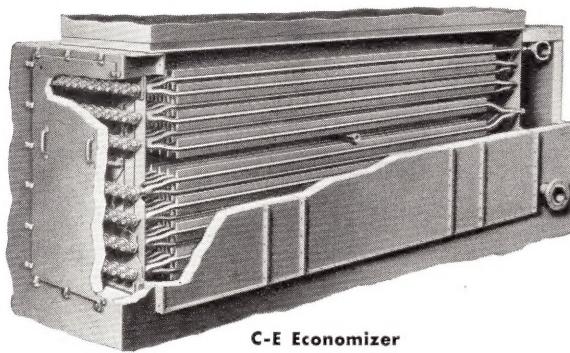
Elesco Superheaters are available in a variety of designs suitable for every requirement. For high-pressure, high-temperature service elements are welded to the headers. For more moderate conditions the Elesco Ball Joint provides a connection that does not require expanded joints or gaskets. A girth type design is available for horizontal return tubular boilers. Separately fired and portable types round out the complete line. The Elesco forged return bend, an exclusive C-E feature, permits the installation of a maximum amount of surface in a given space and assures unrestricted steam flow.

Elesco
Superheater

HEAT RECOVERY

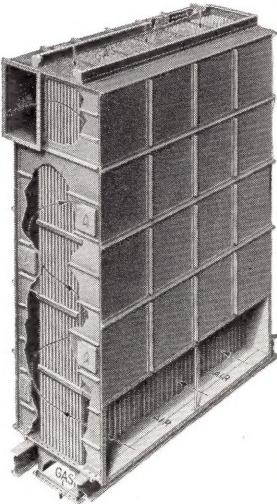
C-E Economizers are available to suit various operating conditions. There are two welded types: one with removable plugs at one end for occasional cleaning, the other which employs completely welded joints and is intended for installations that require no internal access. All C-E

HEAT RECOVERY



C-E Economizer

Economizers have extended surface in the form of welded-on fins, a construction which provides a maximum of heating surface in a given space and assures low draft loss.



C-E Tubular Air Heater

C-E Air Heaters are available in two types—plate and tubular. Both are designed for tightness, low draft loss and low maintenance. They are applicable to all types of boilers.

District Offices and Representatives

Birmingham, Ala., American Life Building
Boston, Mass., Chamber of Commerce Building
Charlotte, N. C., Independence Building
Chattanooga, Tenn., 1032 West Main Street
Chicago, Ill., Bankers Building
Cincinnati, Ohio, Enquirer Building
Cleveland, Ohio, National City Bank Building
Denver, Colo., 1940 Blake Street
Detroit, Mich., Book Building
Hazleton, Pa., Markle Bank Building
Houston, Texas, Mellie Esperson Building
Jacksonville, Fla., Hildebrandt Building



Canada: Combustion Engineering Corporation, Ltd.—Montreal, Toronto, Vancouver, Winnipeg.

Kansas City, Mo., Board of Trade Building
Los Angeles, Calif., Associated Realty Building
Minneapolis, Minn., 2040 Rand Tower
New York, N. Y., 200 Madison Avenue
Philadelphia, Pa., 1616 Walnut Street
Pittsburgh, Pa., First National Bank Building
Rochester, N. Y., 527 First Federal Savings Building
St. Louis, Mo., 5319 Shreve Avenue
San Francisco, Calif., 116 New Montgomery St.
Seattle, Wash., Skinner Building
Washington, D. C., 1603 K Street N.W.